Two hours - on line

The exam will be taken on line.
This paper version is made available as a backup

QUESTION PAPER MUST NOT BE REMOVED FROM THE EXAM ROOM

UNIVERSITY OF MANCHESTER
SCHOOL OF COMPUTER SCIENCE

Agile and Test Driven Development

Date:    Thursday 15th May 2014
Time:    09:45 - 11:45

Please answer ALL Questions provided.

The exam contains MULTIPLE CHOICE and SHORT ESSAY QUESTIONS. Be sure to answer ALL QUESTIONS.

This is a CLOSED book examination

The use of electronic calculators is NOT permitted
Q1 to Q20 are restricted and cannot be published
A group of postdoctoral researchers plans to build a social networking tool for sharing their experiences and disseminating their research. A registered researcher would be able to upload a profile including their affiliation, details of their PhD, details of their current and future work, and a list of publications. They could opt to have these made public, so they would be available to other researchers and prospective employers, or just visible to other registered users. Registered users would also be able to post on the tool’s message board. They plan to have the tool indexed by search engines and linked to other social networking sites. They hope that this will attract other potential registered users, as well as people simply interested in reading the information (such as message board discussions) on the site.

Identify the potential user roles. (2 marks)
22. The students developing the software described in question 21 hold a story writing workshop, and come up with a number of stories including the following:

Story 1: Create account.
Story 2: Use tool to disseminate research.
Story 3: Remove thesis synopsis.
Story 4: Upload journal publication.
Story 5: Upload conference paper.
Story 7: Edit thesis synopsis.
Story 8: Add and remove friends.
Story 9: Send messages.

The team are now building the product backlog. For each of the stories above, explain whether or not it can be added to the product backlog in its current form, justifying your answer. Consider in particular how easy it is to estimate the story length, and whether it would be appropriate to assign it to a developer in a sprint, as it stands.

(8 marks)
23. The following actions all relate to the development of a suite of automated unit tests for a system. In each case, say whether the developer is using a test-driven development style (TDD), a test-first development style (TFD) or a traditional “test after development” (TAD) style in which test cases are written after the production code has been implemented.

i) The developer needs to implement a class from scratch. The first thing she does is write three test cases to help her understand the key parts of the class’ interface.

ii) The developer decides whether to write test code or production code on the basis of the results of running the test suite.

iii) The developer implements a method containing only the statement:

```java
return 0;
```

checks that the implemented test now passes, and checks the code into the repository.

iv) The developer uses the conditions of while loops in the method being tested as a basis for writing the corresponding unit tests. (4 marks)
24. For each of the following lines of Python code, state whether it is production code, or test code, or whether it could be either.

i) 

```python
entry = Entry("Alice", "Bloggs", 1234567890)
```

ii) 

```python
def getPhoneNumber(self):
    return self.phonenumber
```

iii) 

```python
currentTime = time.localtime()
```

iv) 

```python
self.assertEqual(100, queue.maxEntries)
```

(4 marks)
25. You are part of an agile team that is contracting for work from a client organisation you have not worked with before. At present, your team’s bid is leading, but there is one barrier. The client insists that the majority of testing work is carried out by an independent test group, employed by them from another favoured contractor, and is unwilling to resource your team for this part of the work. State the problems that the client’s insistence on this approach to testing will cause for your team. In your answer state any assumptions you make about your team (e.g., methodology used, agile practices used) or the client (e.g., awareness of agile practices, mission criticality of software to be built). (4 marks)
26. In each of the following scenarios, an agile team may be breaking one of the four values from the original Agile Manifesto. For each scenario, state which value, if any, is being disregarded, and give a brief justification for your answer.

i) A co-located team of 5 developers and 1 customer representative has been created to deliver a small but important addition to the customer organisation’s website. One of the developers recommends his preferred story management software. None of the other team members have used this tool before, so he runs several half-day training sessions on how to use it. During these training sessions, the customer representative catches up on e-mail and phone calls unconnected with the project.

ii) An agile software company have been trying to recruit three new developers, but have not been able to find anyone suitable who lives in or is able to move to the local area. Instead, they choose to hire three people who live several hours drive away, which means that the team are only able to be fully co-located once a fortnight. The rest of the time they agree to use a virtual workspace to work together, and hold meetings via teleconferencing software.

iii) A member of a busy sales team is seconded to work with an agile team developing software for the sales staff. She works co-located with the agile team for 2 days every week. Her absence is putting pressure on her sales team colleagues, and so she is keen to let them know that she is working hard for them while with the agile team. To do this, she spends part of each day with the developers writing a report on the decisions made and the achievements of each day, to show to her sales colleagues. To avoid disturbance, she writes the reports in a separate room to the developers.

iv) An agile team is impressing its client by delivering useful software to a reliable release schedule. Half way through the current release, the client organisation receives news that it has won a very lucrative contract, for which it will require some additional functionality to be added to software the team is building. Rather than abandon the work they have done in the current release, in the customer’s absence, the team decides to finish the current release (requiring 3 more 1 week iterations) and then to start to look at how the new functionality can be brought in.
27. What are the benefits and drawbacks of using an agile, rather than a waterfall, approach from the perspective of the customer? Where possible, illustrate your answer with evidence (from research) that demonstrates the efficacy or otherwise of the approach.

(10 marks)